

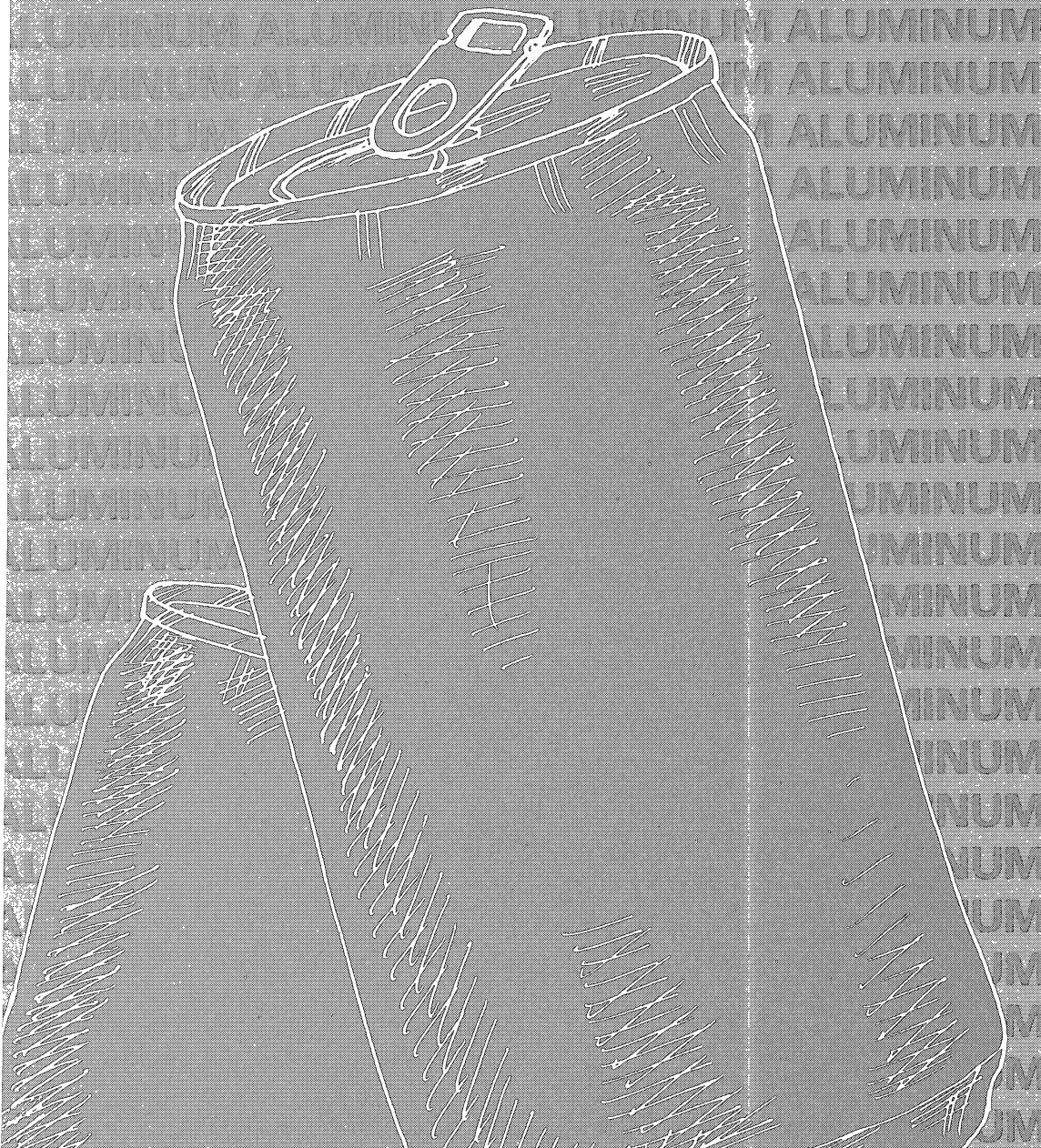
United States  
Environmental Protection  
Agency

EPA/530-SW-90-072B  
April 1993

Solid Waste and Emergency Response (OS-305)

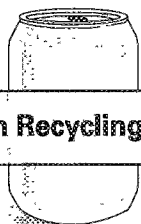


# Summary of Markets for Recovered Aluminum



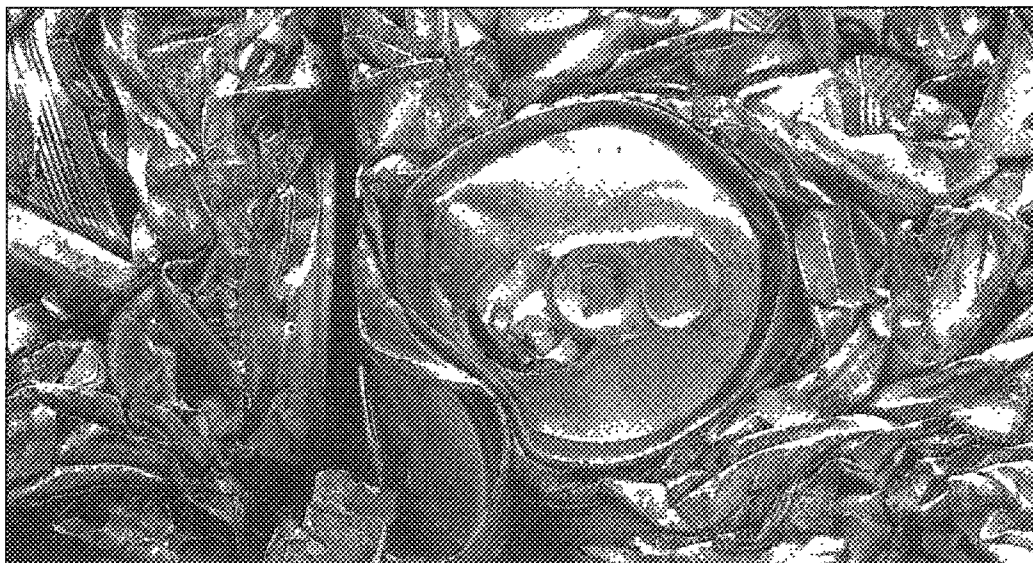
# Summary of Markets for Recovered Aluminum

## The Role of Markets in Recycling



**R**ecycling, along with source reduction, combustion, and disposal in landfills, is a key component of an integrated municipal solid waste management strategy. Recycling may consist of several steps, including collection, separation, processing, remanufacture,

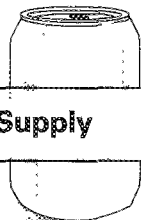
and marketing. A material is not considered "recycled" until *all* of the necessary steps are completed and the "recycling loop" is closed. Since materials must be converted into products and used by consumers to close the recycling loop, understanding the markets for recyclable materials and for goods manufactured from recyclable materials is key to continued and expanded recycling. Markets for recyclable materials, like all markets, are influenced by the laws of supply and demand. As more and more communities across the nation implement recycling programs and more recyclable materials enter the marketplace, both supply and demand are affected.



The U.S. Environmental Protection Agency (EPA) is supporting market development by promoting both government and private sector purchase of goods containing recycled materials; providing assistance to local governments; and researching, developing, and evaluating policy options.

This booklet summarizes EPA's *Markets for Recovered Aluminum*. It describes factors affecting the current supply and demand for recovered aluminum and provides information on future market trends. It also explains how to obtain a copy of the full report.

## Scrap Aluminum Supply

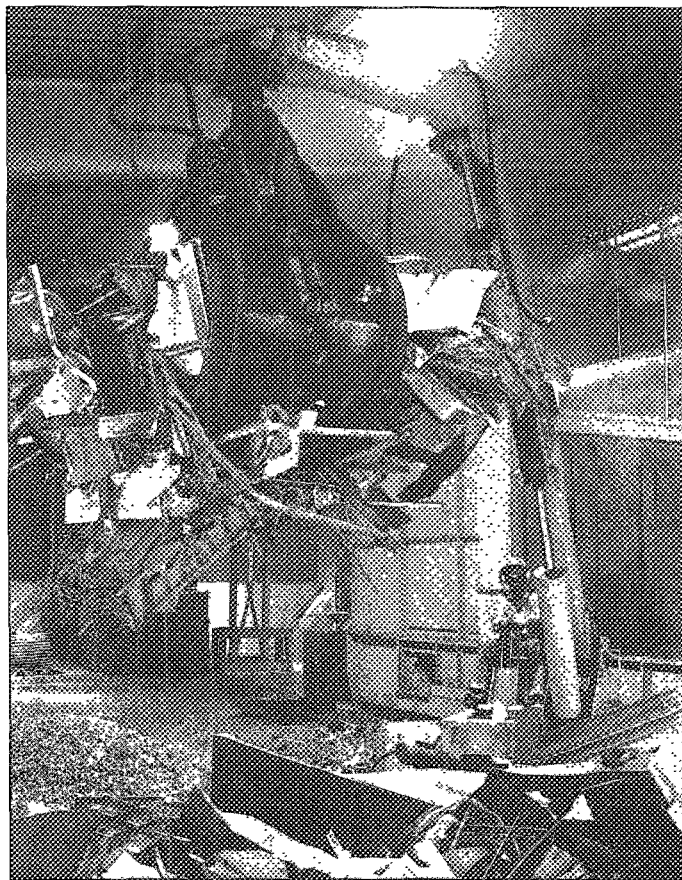


Aluminum has been recycled since the early 1900s, so markets for scrap aluminum are established and comparatively well understood. Scrap aluminum originates from both municipal (mostly aluminum cans) and industrial (scrap from production and old aluminum) sources. Primary aluminum (from virgin

material) is smelted from bauxite, a mineral mined in the United States and several other countries. Bauxite, primary aluminum, and scrap aluminum also are imported and used in manufacturing.

Recovery of scrap aluminum for recycling has increased steadily since 1970. Aluminum recycling often is considered a "success story" in the municipal solid waste world, with recovery rates in 1989 above 27 percent. This highly successful rate of scrap recovery is due in part to the aluminum recycling industry's well-developed infrastructure, which includes scrap dealers, used beverage can collectors, and processors.

Scrap dealers handle the volume of scrap that flows from industry and consumers to aluminum product manufacturers. Aluminum scrap comes in two forms—old and new



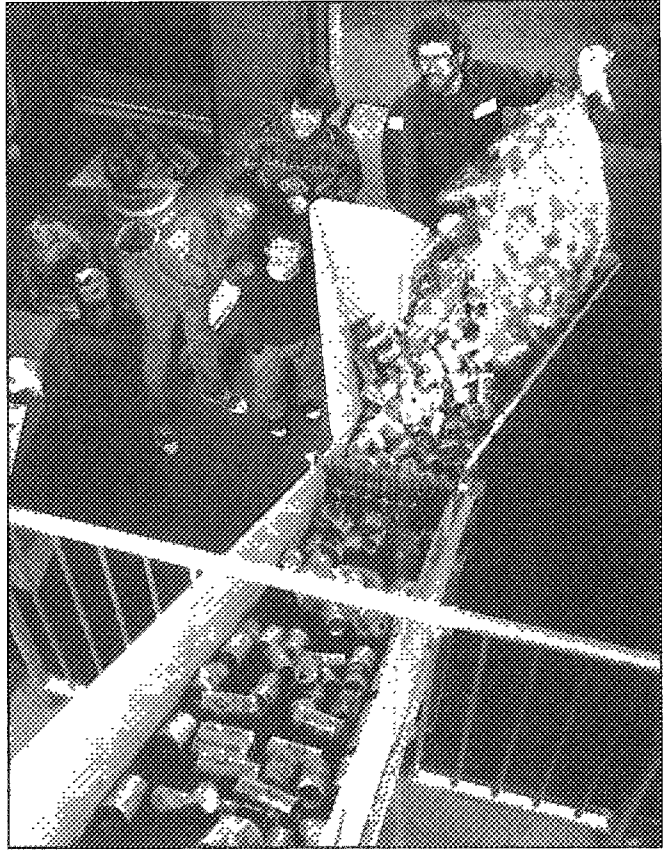
Household and commercial refuse contribute large amounts of potentially recoverable aluminum to the municipal solid waste stream. Scrap handling equipment, like the machinery pictured here, can be used to reclaim discarded automobiles, appliances, and industrial scrap for recycling.

scrap. When products and packaging are formed into shapes, there is often excess aluminum left over. This is defined as "new scrap" since it has not been sent out as a final product. "Old scrap" refers to aluminum products that have been used and collected for recycling. Scrap dealers handle all types of aluminum scrap, from siding to cans to automobile manufacture castings, and sometimes nonaluminum materials as well. These dealers then sort the aluminum scrap, which is consolidated and shredded, baled, or reduced in sweat furnaces to dense ingots for shipping.

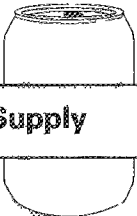
Used beverage can collectors collect aluminum cans from a number of sources, such as municipal programs, drop-off or buy-back centers, bottlers and distributors in states with deposit programs, and nonprofit collection programs. Due to the popularity of recycling in communities, more than 60 percent of all aluminum beverage cans were recovered in 1989.

Secondary smelters use only aluminum scrap in production and are the largest purchasers of non-used beverage can scrap. These smelters are exclusively processors, producing aluminum to various specifications, which is then sold to end users and used in manufacturing.

The success of recent recycling efforts has caused a significant increase in the market share of aluminum scrap. In 1989, recovered aluminum accounted for over 28 percent of the aluminum supply of the United States, an increase of 52 percent over its 1970 share of 19 percent.



Americans bring all kinds of aluminum to recycling centers, ranging from aluminum siding and lawn furniture to beverage cans.



### Factors Affecting Supply

Several factors, particularly cost, influence the supply side of the market. The major cost for aluminum scrap dealers and secondary smelters is the cost of scrap, which is greater than all of their other costs, including labor, handling, processing, and marketing. This demand is what makes aluminum such a "recyclable" material: aluminum is easy to reuse without a great deal of expensive processing.



Deposit programs currently in place in nine states (plus California, which assigns a redemption value to beverage containers) affect supply by assigning a deposit value to aluminum beverage containers that is independent of scrap value. Charging a deposit fee artificially raises the containers' cost to consumers, resulting in a higher quantity of containers collected. Deposit programs do not increase the value of used beverage cans once they leave the collectors, but the effect is to push more used beverage cans into the scrap market than otherwise would be there.

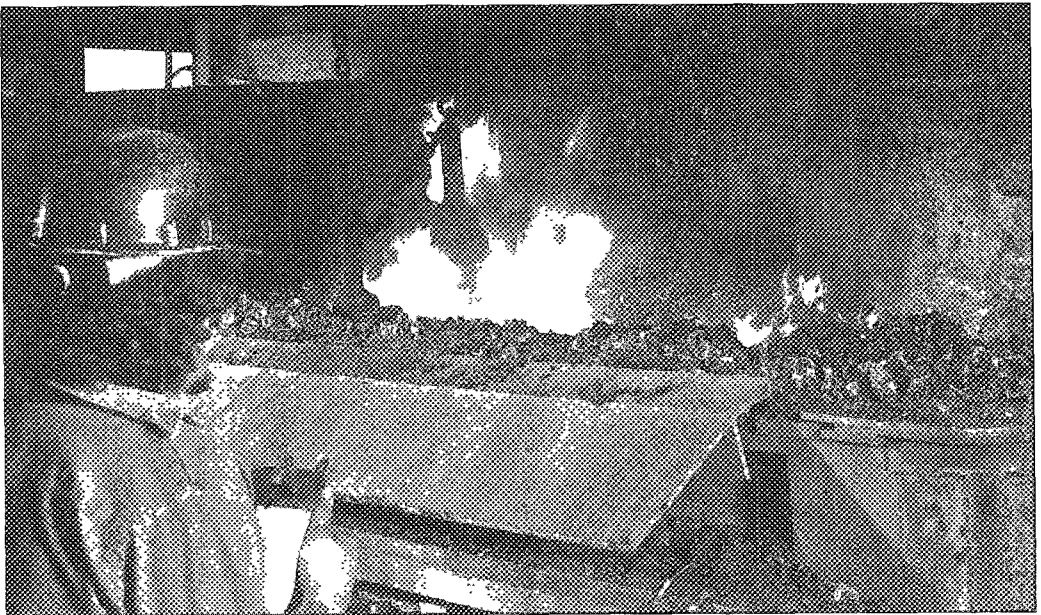


### Future Trends in Supply

The major trend in the coming years will continue to be an increase in supply

of consumer-generated aluminum scrap. As land disposal and combustion costs increase and disposal sites become less available, recycling is becoming an extremely attractive waste management option for many communities across the nation. Several states and municipalities are implementing mandatory recycling programs, imposing taxes on nonrecyclable or nonrecycled packaging, and developing other initiatives designed to increase recycling of many types of materials. As these programs succeed and grow in number, the supply of inexpensive consumer-generated scrap aluminum will expand.

Industrial recycling has been practiced longer than residential recycling. While not growing as rapidly as residential recycling, industrial recycling might expand further when plants are able to recover more aluminum scrap and when recovery of industrial waste becomes more economical.



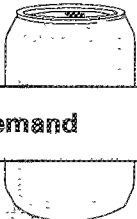
Shreds of aluminum are fed into a melting furnace as a quality control technician oversees the operation.



## Demand for Scrap Aluminum

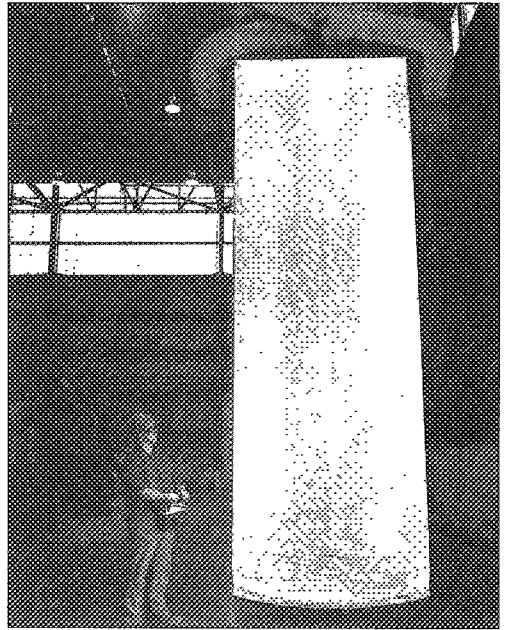
Scrap consumers include primary sheet and ingot producers, which smelt aluminum from bauxite, but also use scrap aluminum; secondary smelters, which convert scrap into ingots meeting predetermined specifications; fabricators, which manufacture consumer products such as cans, appliances, and pails; and foundries, which produce castings for automobiles, motors, and hardware. In addition, a major portion of aluminum scrap (650,000 tons in 1989) is exported; approximately 60 percent of this is sent to Japan.

Until the 1970s, secondary smelters were the dominant purchasers of aluminum scrap, but with the rising cost of primary production, primary producers are starting to purchase used beverage cans and other relatively "clean scrap" (with fewer impurities). Clean scrap is more cost efficient than raw material and easier to make into new products than contaminated scrap. Contaminated scrap, such as most non-used beverage can scrap, is more difficult to recycle since it often is attached to or alloyed with other materials that make the scrap more expensive to process.



## Factors Affecting Demand

One of the major reasons recovered aluminum has increasing importance in the marketplace is that it has become



Molten aluminum is gradually hardened into ingot form. Hardened ingots are shipped to a fabricating plant where they are rolled into aluminum sheet and incorporated into new products. A 30,000-pound ingot of reclaimed aluminum can be recycled into 750,000 new beverage cans, for example.

cost competitive with imported and domestic primary aluminum made from virgin materials. Primary production of aluminum from bauxite consumes a great deal of electricity; therefore, the price of electricity is an important factor affecting scrap aluminum demand. Since the United States has the highest electricity costs of any aluminum-producing nation, foreign producers have the competitive advantage of offering the same product at a lower price. This competition has prompted domestic producers to shift more and more to using scrap aluminum, which requires 95 percent less energy than producing primary aluminum from bauxite. In addition, since the United States produces less than 1 percent of the world's bauxite, primary producers must import a large amount

of bauxite. When the dollar weakens, raising the cost of importing this raw material, utilization of scrap aluminum becomes even more attractive.

Another factor that influences demand is the distribution of aluminum scrap to end users and collectors. Most end users purchase scrap locally, and most collectors and dealers are small operations located near industrial or consumer generators of scrap. The scrap market for aluminum in general, therefore, tends to have regional fluctuations.

The one exception is the market for used beverage cans. This market is more national, since used beverage can scrap brings such a high price and is so versatile for end users, and also because a highly developed collection infrastructure exists.

Scrap consumers often purchase only certain types of scrap, depending on production processes. For example, beverage can manufacturers buy only used beverage cans. Because firms are selective in their choice of scrap, they are



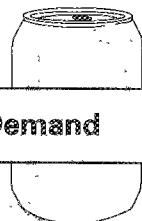
Shredded old aluminum cans can be transformed into filled, store-ready beverage containers in as little as 6 weeks.



These coils of aluminum sheet are being inspected before shipment to a plant where they will be made into cans. After the recovered aluminum has been converted into cans, all that remains to "close the recycling loop" is for consumers to use this final product.

able to manufacture products that are indistinguishable from primary products. Thus, aluminum scrap has no stigma attached to it as a raw material for use in production.

Finally, demand for aluminum scrap is dependent on the demand for finished aluminum products, which fluctuates with consumer demand and the state of the economy. For example, during the recession in the early 1980s, the automotive industry was hit particularly hard, and, as a result, demand for aluminum castings declined.



### Future Trends in Demand

Political pressure to promote recyclable packaging, along with increasing competition in the packaging industry, indicates that primary producers will continue to purchase more consumer-generated scrap. Demand for scrap aluminum, therefore, will increase,



although scrap prices may fall in the next few years due to an increase in the total volume of scrap in the market.

Even though demand for aluminum scrap may increase, demand for aluminum products has slowed, resulting in less growth in the three main domestic markets for aluminum: beverage containers, automobiles, and construction. Exports of aluminum, however, will continue to grow. Even if domestic demand

for aluminum products were to expand, any corresponding increase in production would be slow. This is because, from 1980 to 1987, imports combined with reduced growth of aluminum product consumption caused many manufacturers to reduce the capacity of their facilities. From these indications, experts predict a growth rate of only 1 percent for the aluminum industry as a whole through 1993.

### **Market Report Availability**

A copy of the full report, *Markets for Recovered Aluminum* (EPA/530-SW-90-072A), is available from the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161, 703-487-4650.